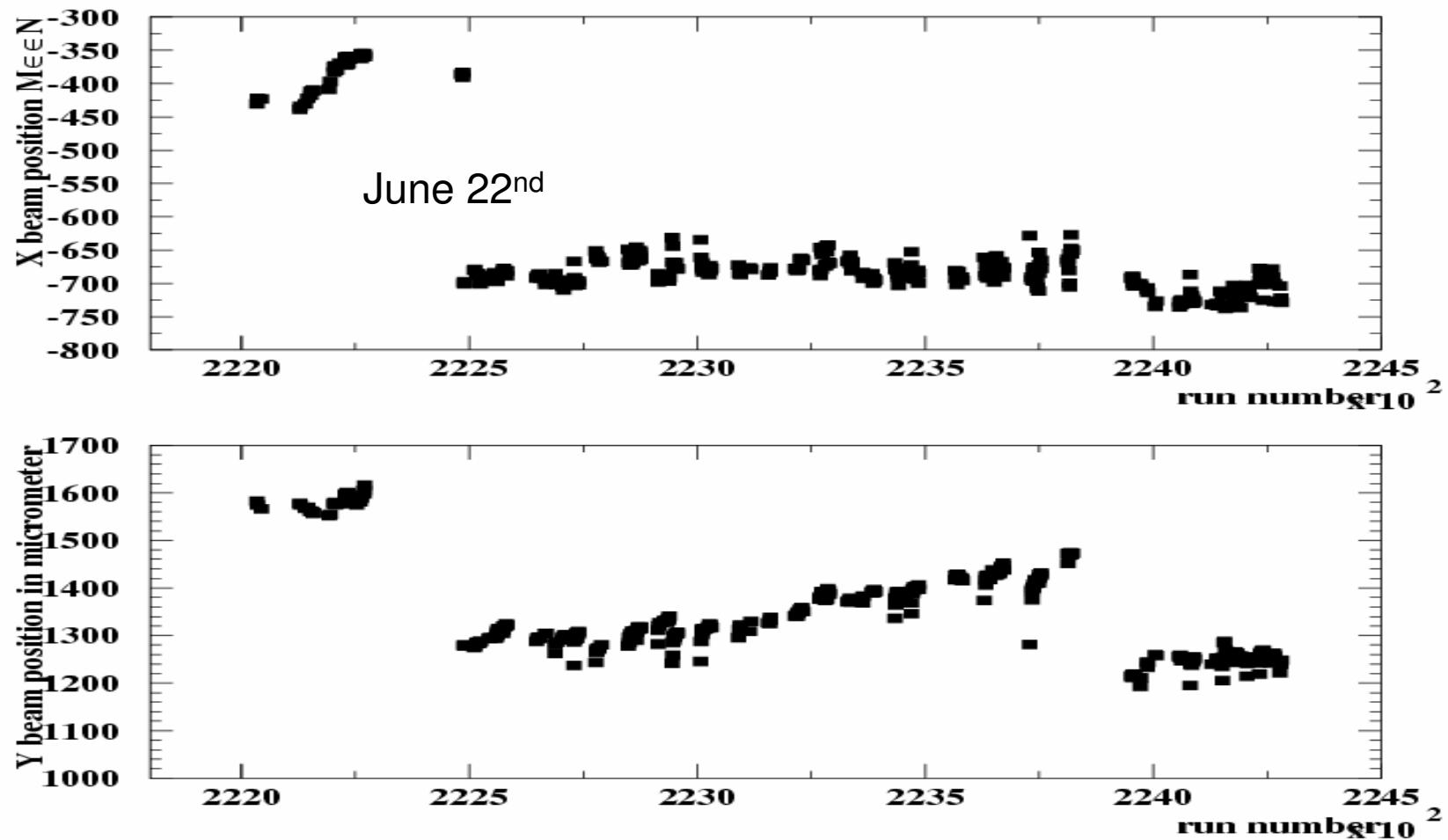
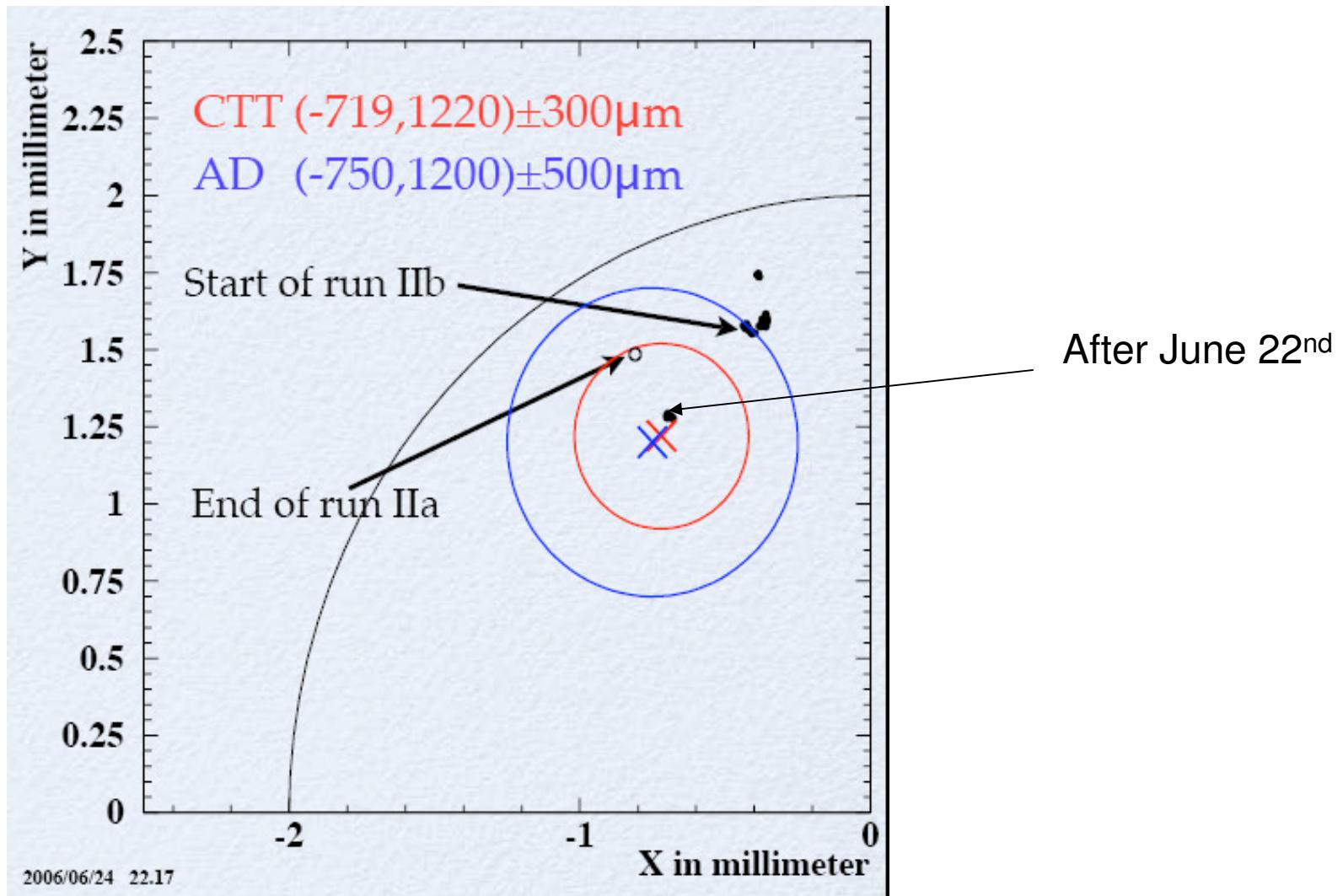


Beta* @ D0

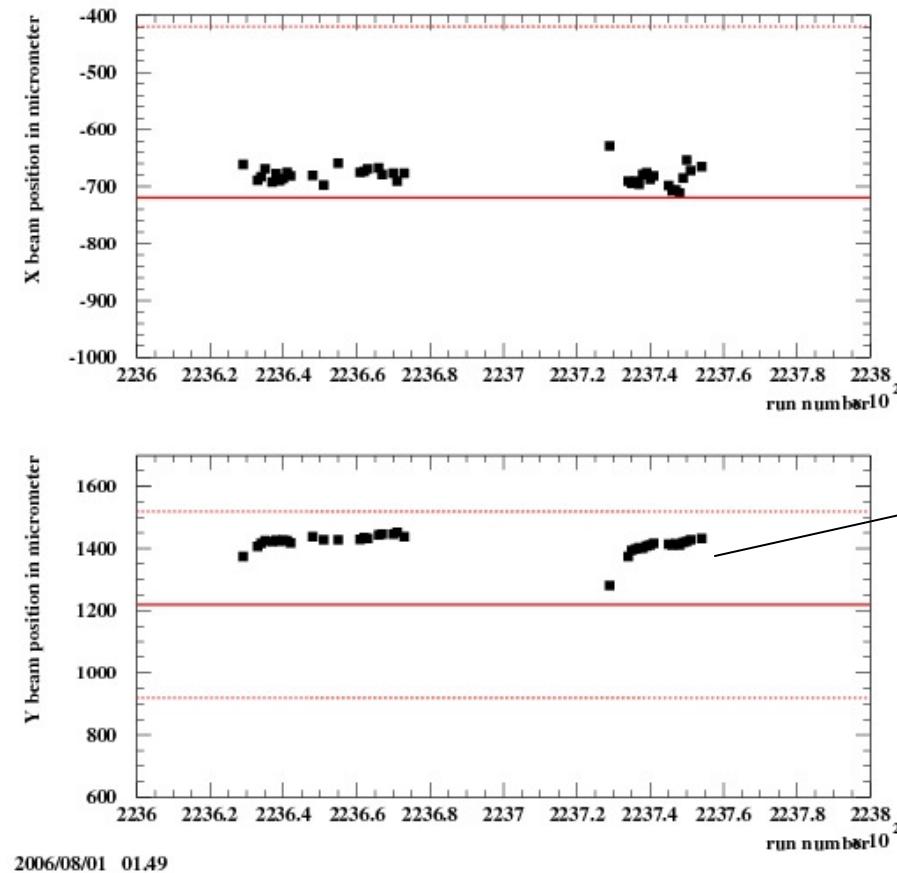
M. Weber, FNAL
A. Chandra, UCR

Beam positions



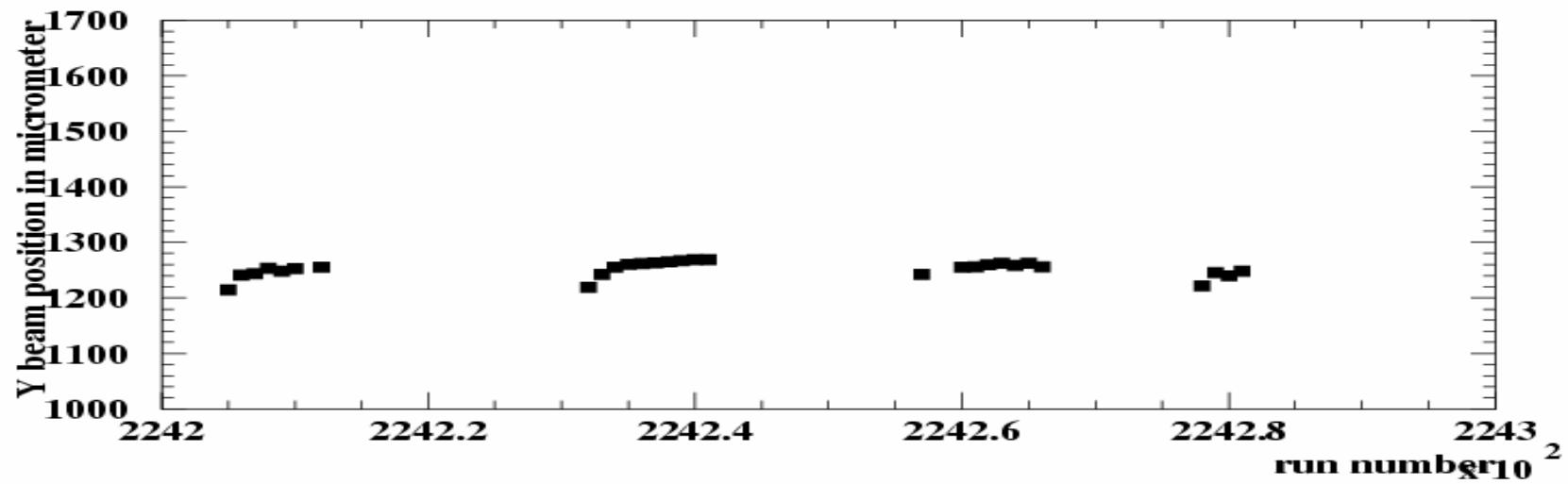
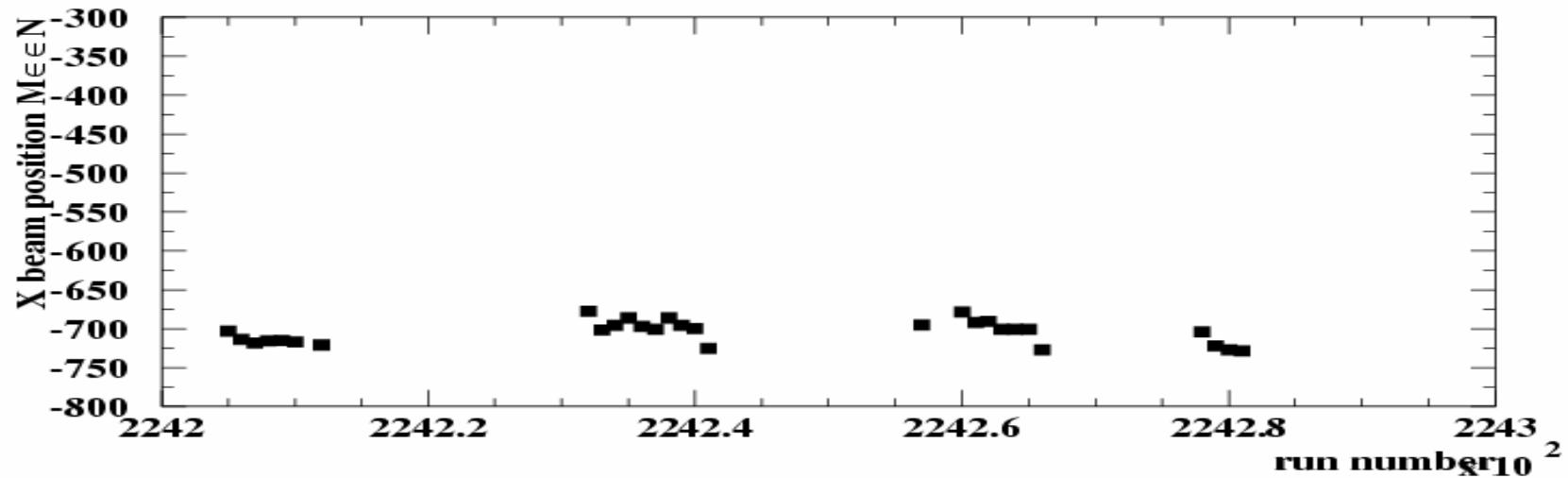


Stores 4859 and 4862



Variation within
a store

Last 4 stores



DZero beta*

lumi task force 8/16/06

Beta* measurement at D0

$$(1) \quad D = y \cos(\phi) - x \sin(\phi)$$

$$(2) \quad \text{cov}(D_1, D_2) = \frac{1}{2}(\sigma_x^2 - \sigma_y^2) \cos\left(\frac{1}{2}(\phi_1 + \phi_2)\right) + \frac{1}{2}(\sigma_x^2 + \sigma_y^2) \cos(\phi_1 - \phi_2) - \sigma_x^2 \sigma_y^2 \sin\left(\frac{1}{2}(\phi_1 + \phi_2)\right)$$

$$\begin{aligned} (3) \quad \text{cov}(D_1, D_2) &= \langle D_1 D_2 \rangle = \\ &= \text{cov}(d_1 + e_1, d_2 + e_2) = \langle d_1 d_2 \rangle + \langle d_1 e_2 \rangle + \langle d_2 e_1 \rangle + \langle e_1 e_2 \rangle = \\ &= \langle d_1 d_2 \rangle \end{aligned}$$

$$(4) \quad \text{cov}(x, y) = \langle xy \rangle - \langle x \rangle \langle y \rangle$$

$$(5) \quad \langle x \rangle = 0$$

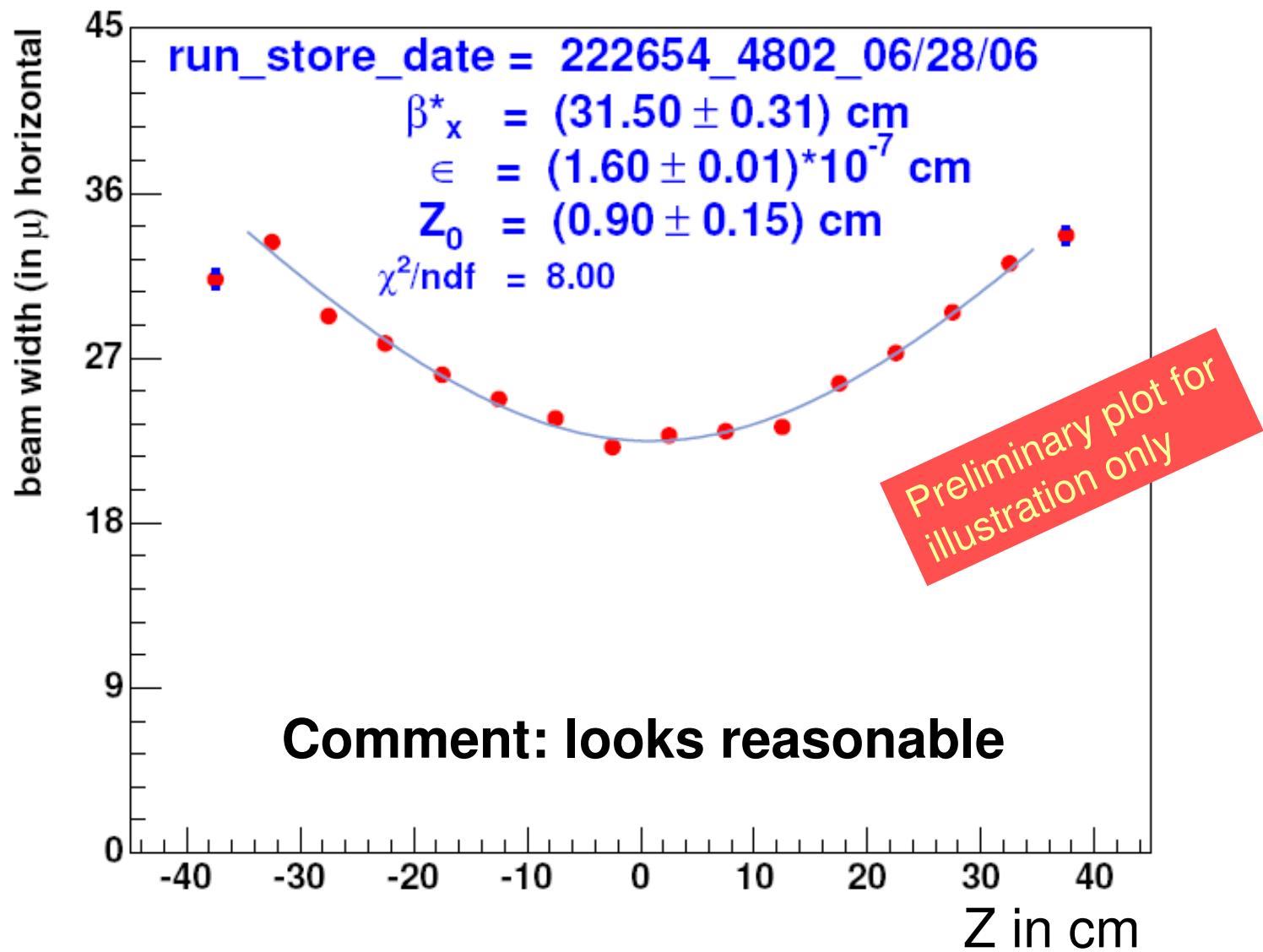
$$(6) \quad \langle y \rangle = 0$$

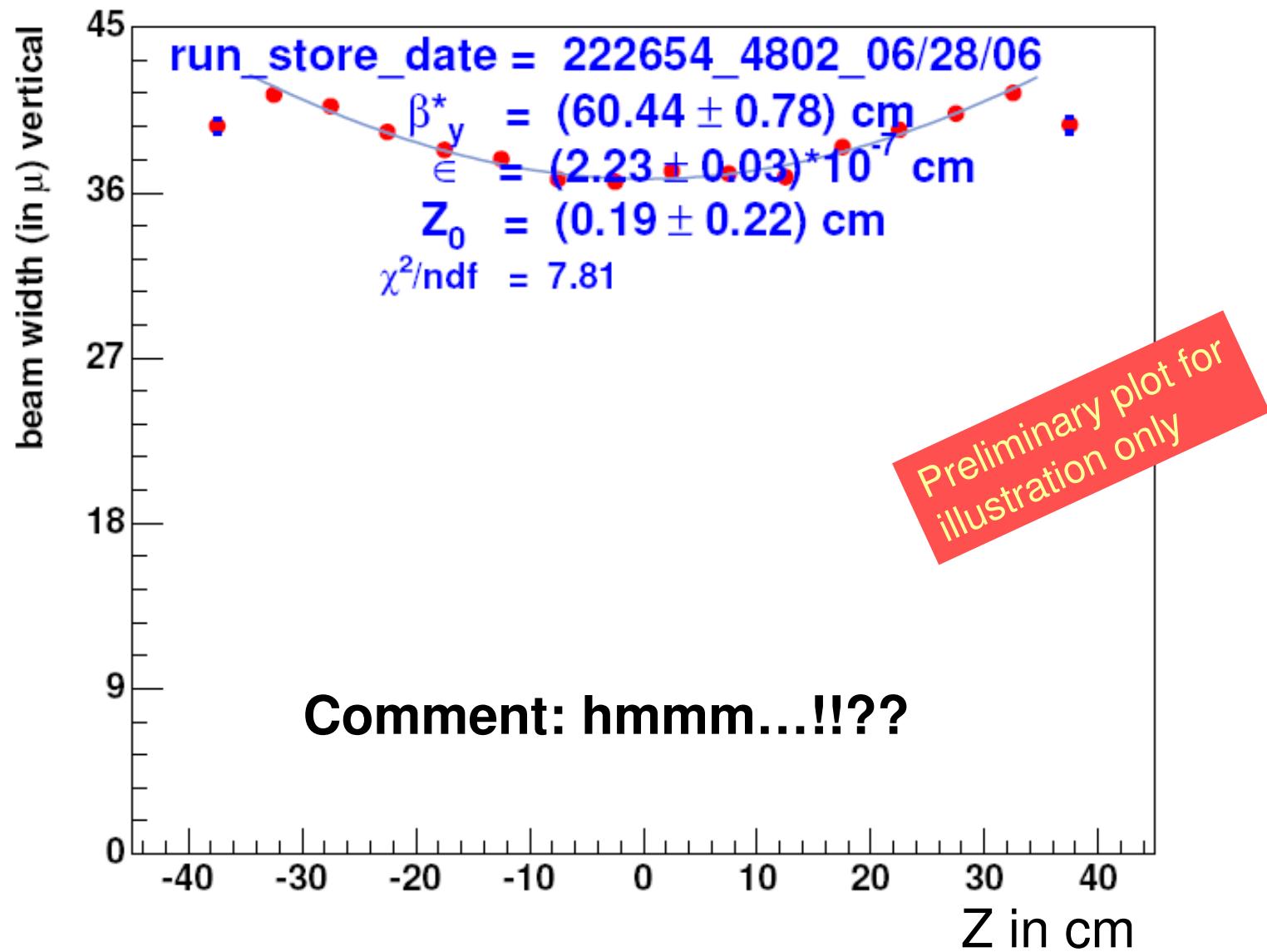
$$(7) \quad \langle d_i e_j \rangle = \langle d_i \rangle \langle e_j \rangle = 0$$

$$(8) \quad \langle e_i e_j \rangle = \langle e_i \rangle \langle e_j \rangle = 0$$

Improvements

- Hardware (shutdown)
 - Added Layer0
 - Replaced L1 calorimeter trigger hardware
 - Increased lookup table size for track trigger
Full granularity / less fake tracks
- Software
 - Accommodate hardware changes
 - Updated the beta* software to use the DZero Common Analysis Format tools

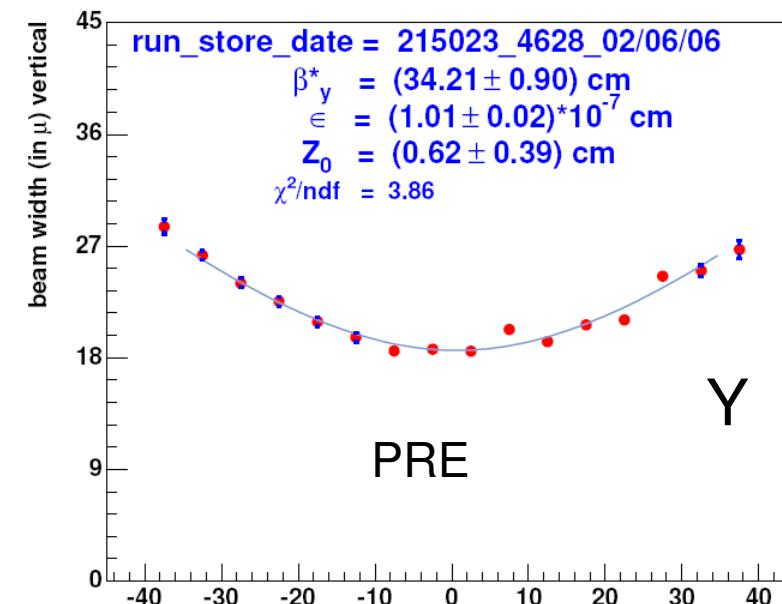
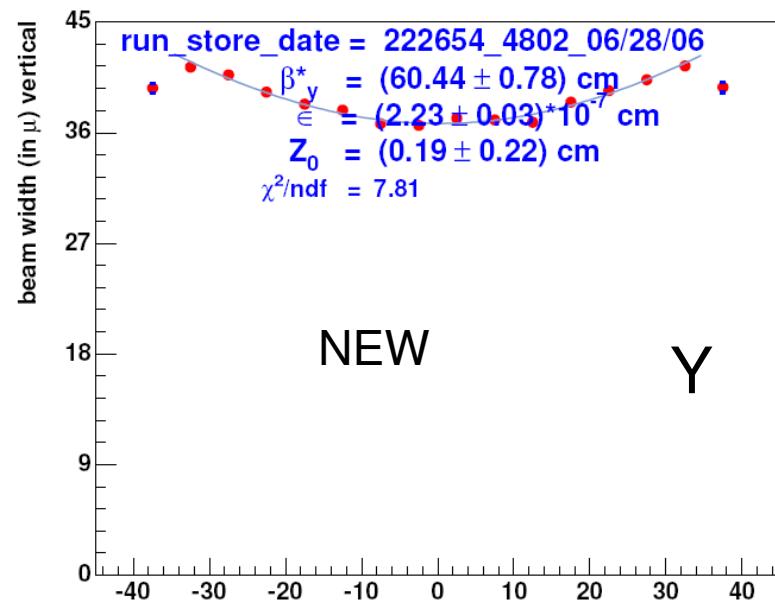
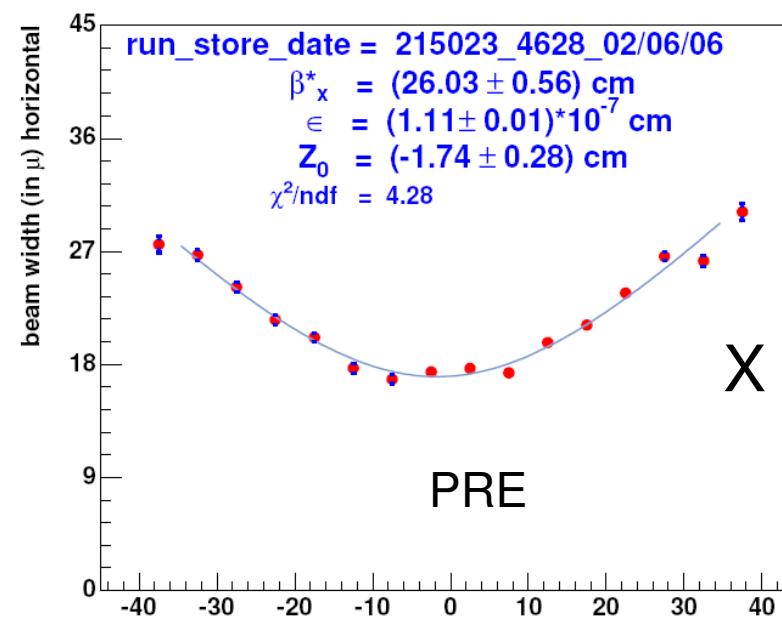
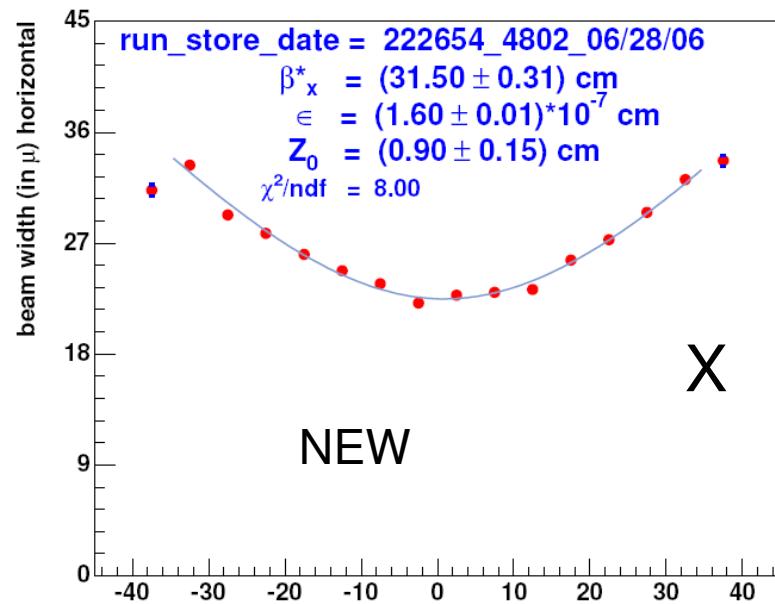




DZero beta*

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9



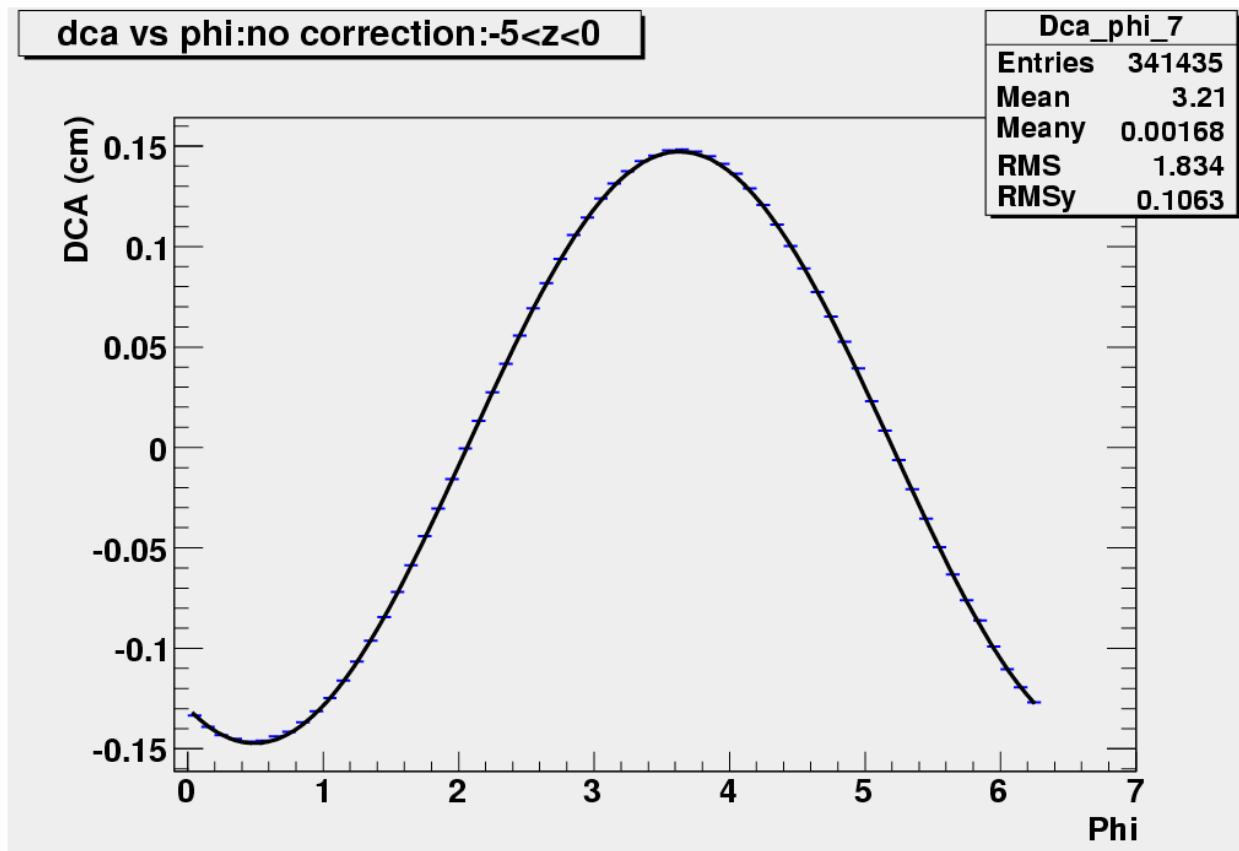
DZero beta*

lumi task force 8/16/06

10

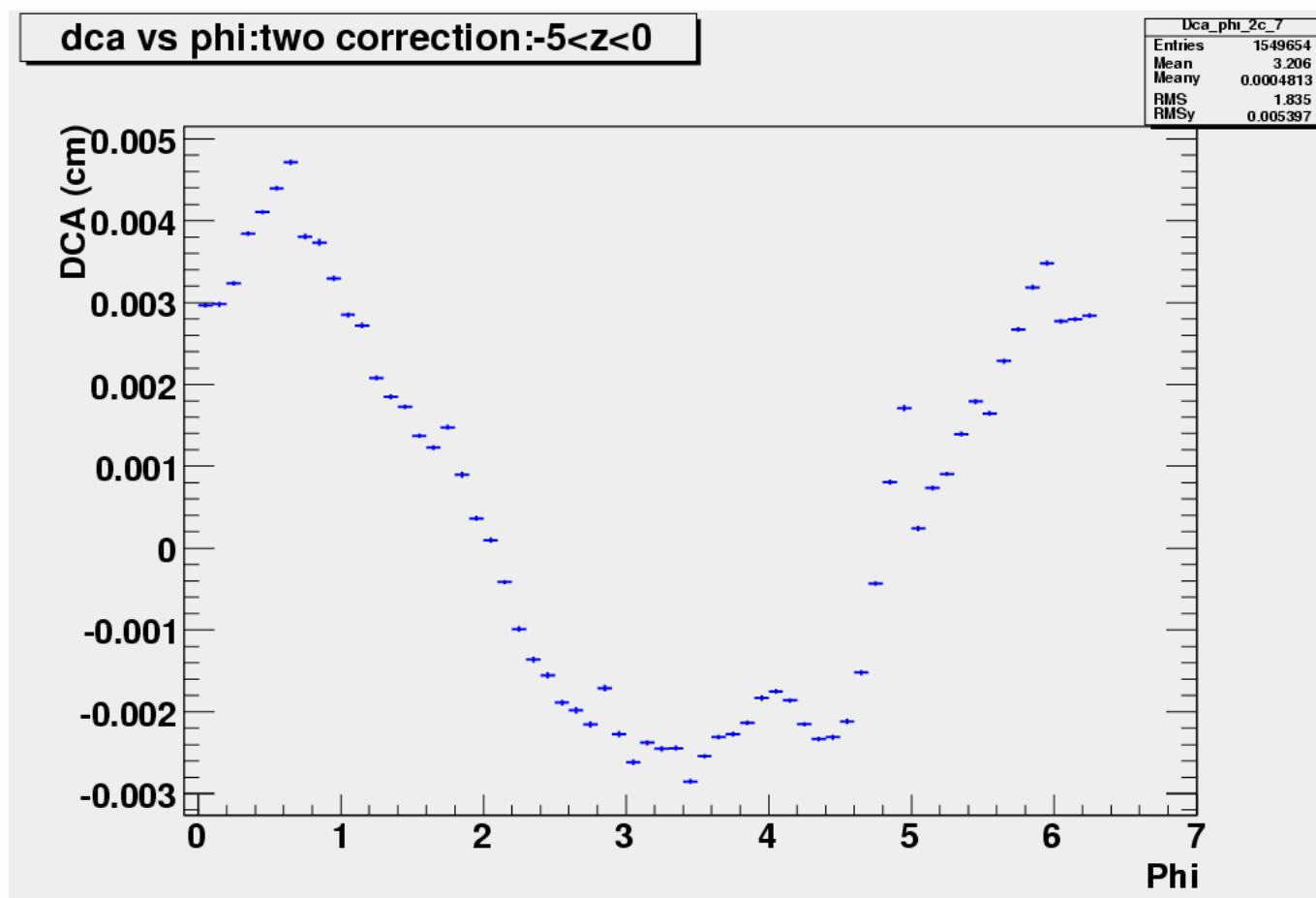
Store 4802

(June 27th, run 222653 ~4h into the store)

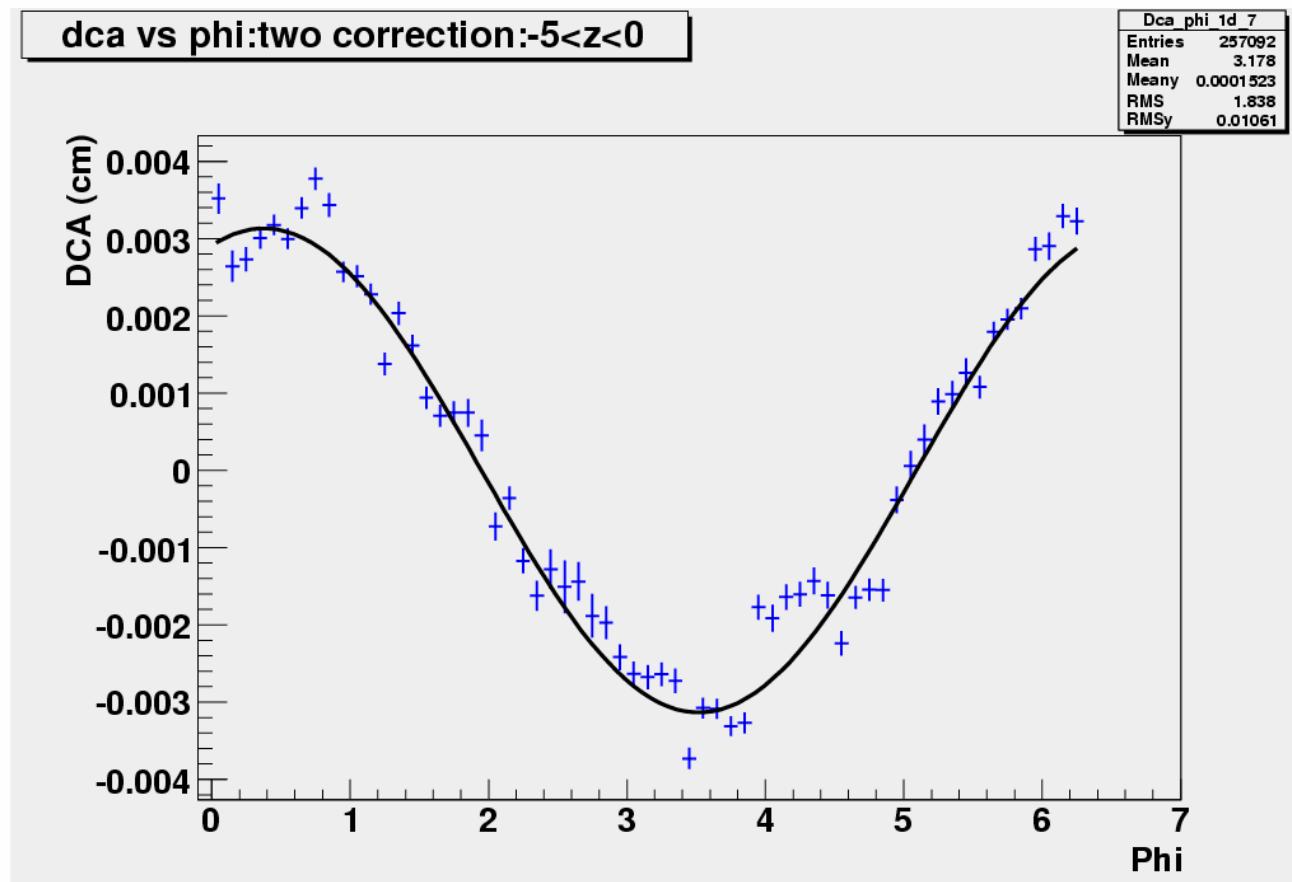


Fit x,y beam as from (1) on slide 6

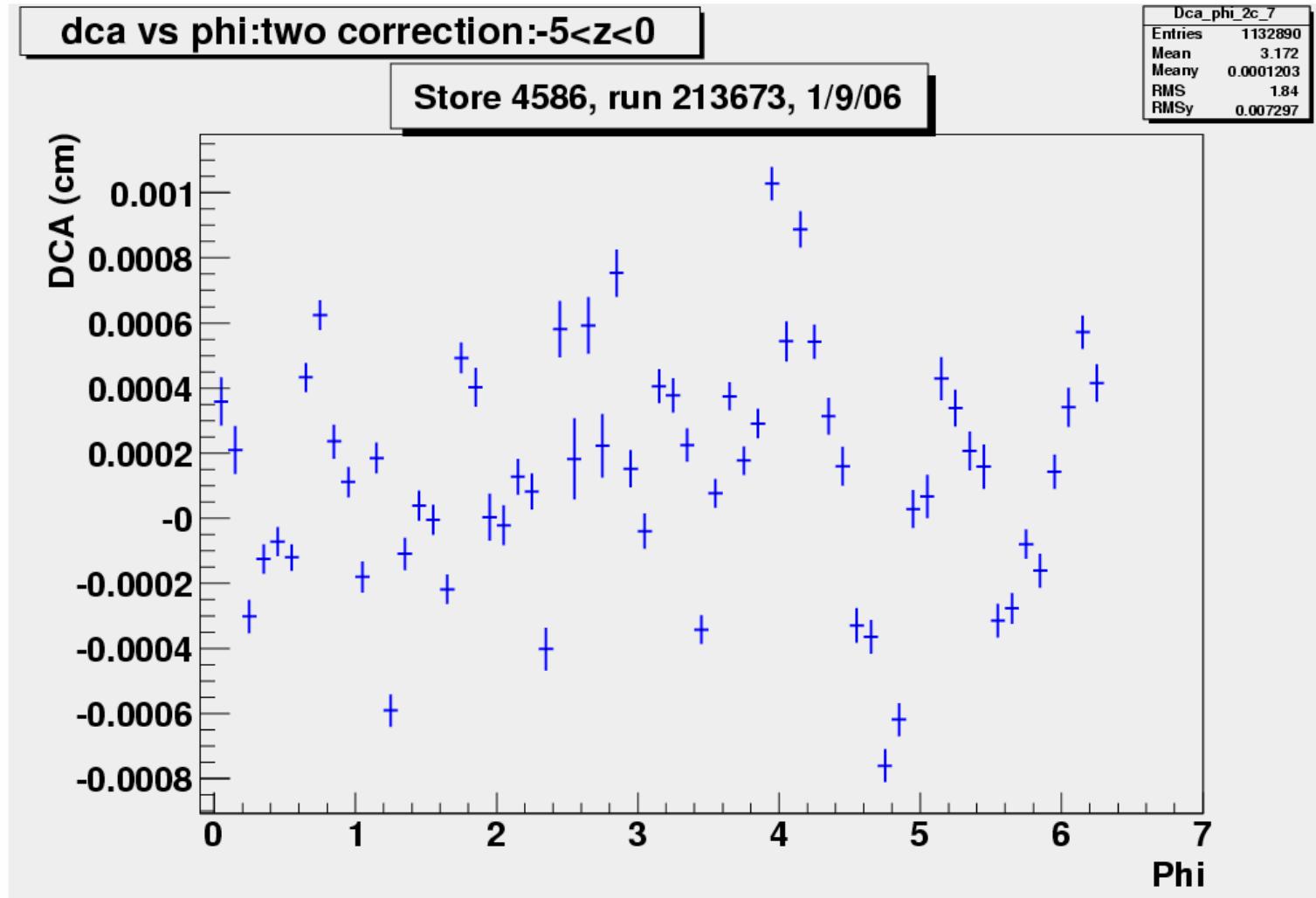
After correction for beam position



After one correction pre-shutdown



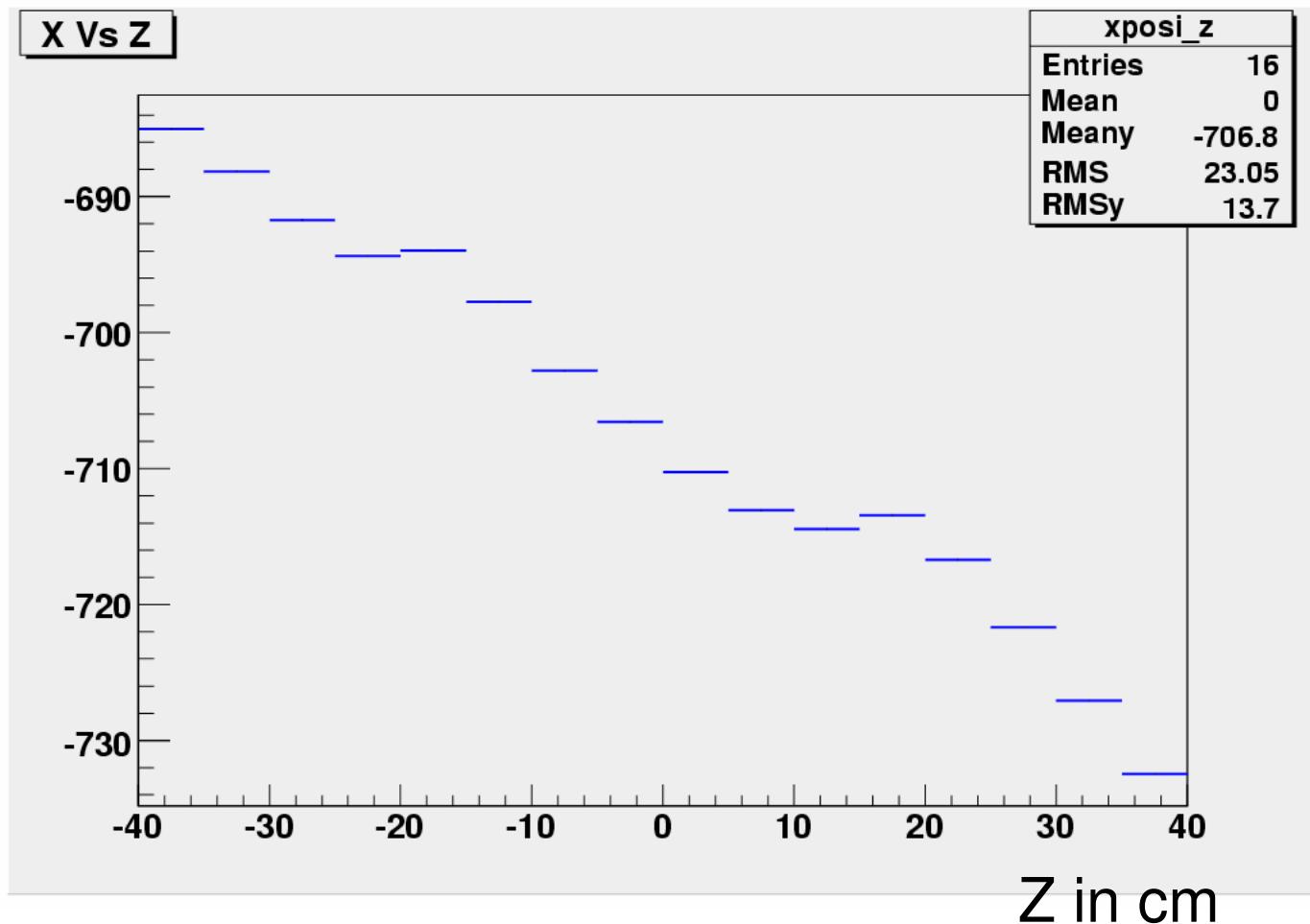
Final corrections pre-shutdown



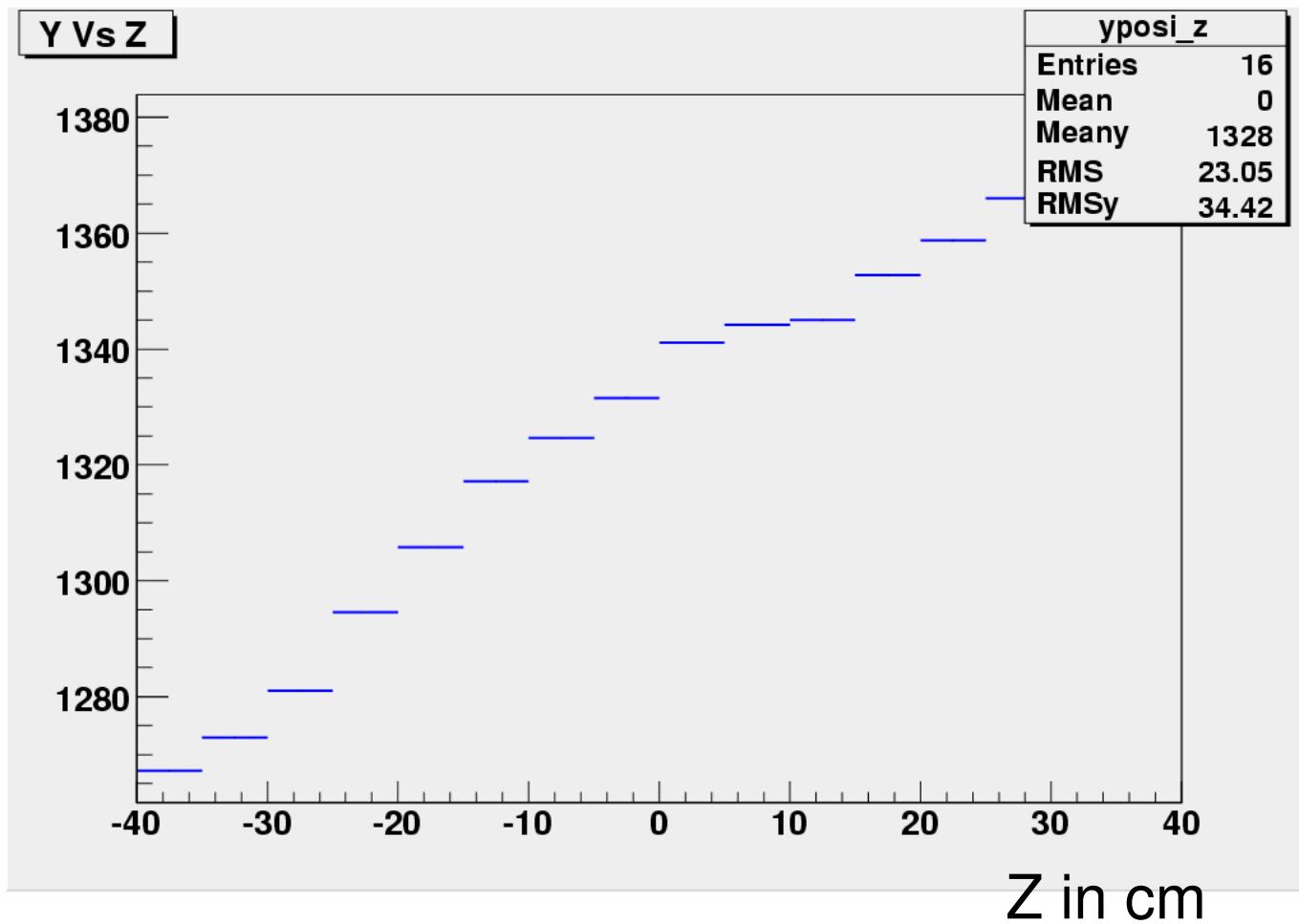
Investigating...

- 2nd correction iteration
- New software (reconstructing old runs with new software)
- Alignment
- Tracking with Layer0
- Vertexing
- Toy-MC
- Alternative code
- Direct beam width measurement

X vs Z



Y vs Z



Store 4847

(July 21st, run 223441 ~20h into the store)

